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December 5, 2017

VIA ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: Notice of Ex Parte
***Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258; *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish Procedure and Deadline for Filing Spectrum Access System (SAS) Administrator(s) and Environmental Sensing Capability (ESC) Operator(s) Applications*, GN Docket No. 15-319**

Dear Ms. Dortch:

On December 1, 2017, executives of Federated Wireless, Inc. ("Federated" or "Federated Wireless") including Iyad Tarazi (CEO), Kurt Schaubach (CTO), and the undersigned Ross Vincenti (CLO), together with their counsel from Akin Gump, Jennifer Richter and Steve Rowings, had a series of meetings at the FCC to: (1) provide updates on technical trials and field testing for the Citizens Broadband Radio Service ("CBRS") which confirm there is a readiness to launch commercial service in mid-2018; (2) discuss the urgency of moving forward with Spectrum Access System ("SAS") administrator and Environmental Sensing Capability ("ESC") operator certifications, including setting a deadline; and (3) provide perspective on issues under consideration in the Notice of Proposed Rulemaking ("NPRM"),[1] especially the importance of facilitating secondary markets to solve a number of issues. The meetings included the following individuals from the Federal Communications Commission ("FCC"): Commissioner Michael O'Rielly and his legal advisor Erin McGrath; Commissioner Jessica Rosenworcel and her legal advisor Umair Javed; Rachael Bender, legal advisor to Chairman Pai; Louis Peraertz, legal advisor to Commissioner Clyburn; Kevin Holmes, legal advisor to Commissioner Carr; Paul Powell, Becky Schwarz, Matt Pearl, Jessica Greffenius, and Kamran Etemad of the Wireless Telecommunications Bureau; and Robert Pavlak and Navid Golshani of the Office of Engineering and Technology.

Technical Trials and Field Testing – Readiness to Launch CBRS in 2018. Federated discussed the industry's readiness for commercial launch of CBRS in mid-2018, as detailed in the attached presentation. Federated alone has conducted 30+ technical trials, and has a number of important field trials underway with Charter, Verizon, American Tower, and ARRIS / Ruckus Wireless. The Federated "Spectrum Controller" has been deployed in the technical and field trials, and commercial ESC sensors are operating and under evaluation by the Department of Defense. Federated and its partners also are testing CBRS equipment compatibility with eight different OEM

[1] *Promoting Investment in the 3550-3700 MHz Band, et al.*, GN Docket No. 17-258, Notice of Proposed Rulemaking and Order Terminating Petitions, FCC 17-134 (2017).

vendors. Through its trials, Federated presently has over 200 CBSDs on the air and connected to its SAS, and it is processing 18,000+ spectrum grant requests per week.

The Federated "Spectrum Controller" was discussed in detail. Launched at the Mobile World Congress Americas this past September, the Spectrum Controller provides capabilities for users to plan and manage CBRS network deployments, offering a graphical user interface that allows users to generally understand where CBRS spectrum is available, leveling the playing field for users large and small without revealing specific CBSD locations. Equal access, equal opportunity, and neutrality are hallmarks of the Federated approach, and this is apparent in how its Spectrum Controller functions.

The parties discussed the fact that the technical and business work undertaken by Federated for CBRS is furthering the CBRS opportunity, making it a reality. The parties also noted that the information from the Federated trials will be useful to conclude SAS administrator certification and resolve the issues raised in the NPRM.

Urgency to Conclude SAS and ESC Certifications – Need to Set a Deadline. The parties discussed how far the CBRS industry has evolved, with material support and adoption already occurring. Concern was expressed, however, that the Commission should not slow down CBRS progress. Questions were raised about whether certification has become a bottleneck. Asked if the Commission should set a date certain for certification, Federated suggested that it would benefit all stakeholders, including industry and the Commission, if a deadline for certifications is set for June 30, 2018. Providing certainty about the timing of certifications will support and enhance investment in, and momentum for, CBRS.

Urgency to Conclude NPRM – Secondary Markets is the Key. Speed on certifications will create the most certainty for the CBRS market right now, but speed in concluding the NPRM also is important. Federated supports the goal of concluding the NPRM proceeding by the end of Q1 2018. Federated emphasized the importance of resolving remaining CBRS issues in a manner that preserves access to CBRS spectrum for as many users—and use cases—as possible.

Federated made clear the two principles it feels are critical for CBRS success: (1) ensure equal access to CBRS spectrum for all, as maximum participation will benefit the ecosystem by creating industry-wide scale for devices, chips, and equipment, which in turn will lower the per-unit cost and enable all CBRS use cases, from nationwide carrier deployments to localized enterprise uses; and (2) rely upon secondary markets, administered through the SAS, as a frictionless way of making CBRS spectrum available to all players regardless of size. A robust secondary markets system for CBRS, administered by the SAS and with the right incentives, will ensure that licensed CBRS spectrum is made available to all those that require it—and could thereby make license size a less relevant consideration in enabling spectrum access. Secondary markets should be considered in close conjunction, and in a holistic manner, with the resolution of Priority Access licensing issues. SAS administrators can facilitate and expedite secondary markets transactions, automate them, protect the operations of all players, and handle all reporting to the FCC.

The Commission is leading the world with its new spectrum sharing paradigm through the CBRS band. There is tremendous interest in sharing approaches and the technologies worldwide; other countries want to leverage the FCC's visionary approach. Near term success in the CBRS band will become a template for spectrum management in the future, both domestically and internationally, but focus is needed now to conclude certifications and the NPRM. Federated

Wireless appreciates the opportunity to share its CBRS accomplishments, technical trials and field trials with the Commission, and thanks the Commission for its leadership and support in bringing spectrum sharing and CBRS to market.

Respectfully submitted,

/s/ Ross Vincenti

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Federated Wireless

unlocking a spectrum of possibilities

December 1, 2017

federated wireless

Federated Wireless

Pioneering Shared Spectrum Technology

- HQ in Arlington, engineering center in Boston, executive office in Silicon Valley
- Founded in 2012, nearly $75M invested to date, raised $42M Series B funding
- IP developed by founding technologists from Virginia Tech, Department of Defense (DoD), and Defense Advanced Research Projects Agency (DARPA)
- Leader in software solutions to enable a revolutionary shared spectrum paradigm
  - Founder and Co-Chair WInnForum Spectrum Sharing Committee
  - Co-founder and Board member CBRS Alliance

Series B Investment

Deal terms

- Proceeds: $42m
- o/w new investors: $27m
- Use of proceeds: sales & marketing, continued R&D; and infrastructure investment
- Valuation (pre): $79.5m
- Valuation (post): $121.5m
- Deal materially over-subscribed

Syndicate

Charter

GIC

ARRIS

ALLIED MINDS

AMERICAN TOWER®

woodford

Impact of strategic investors

	Description	M.V.(1)	Rationale
Charter	#2 US cable company	$99bn	✓ 3.5G underpins wireless strategy ✓ 16.6m cable customers who could benefit from spectrum sharing ✓ Scale: benefits all segments
ARRIS Ruckus WIRELESS	Leader of end-to-end Enterprise and Residential Wi-Fi System Solutions	$5bn	✓ High leverage channel to market via millions of integrated broadband systems ✓ Product: consumer + enterprise integrated solutions enablement
AMERICAN TOWER	Largest US owner / operator of wireless / broadcast infrastructure RE	$59bn	✓ 140k global assets: towers, fiber, venue access and DAS systems ✓ High leverage channel to market ✓ Product: enterprise solutions

(1) As at close 8 Sept 2017

Shared spectrum value drivers

Accelerating adoption for shared spectrum

- Access to abundant quantity of high quality spectrum
- Open standards ecosystem
- 4G and 5G compatible
- 50-80% savings in cost of deployment vs. traditional Distributed Antenna Systems (DAS)
- Plug and play deployment enabling new entrants and new applications

Ready for commercialization in 1H’18

Use cases and market drivers

MNO

- Network densification in populated areas
- Capacity expansion

MSO

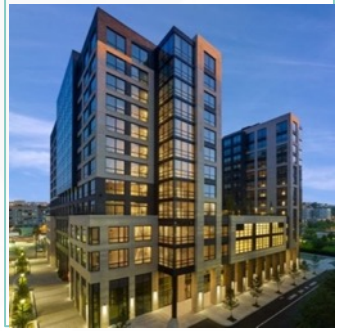
- Wireless MVNO offload
- Smart home

Neutral Host / MSP

- Cost-effective DAS alternative
- Venues, MDUs, Dorms

Enterprise

- Private LTE Networks
- Industrial IoT



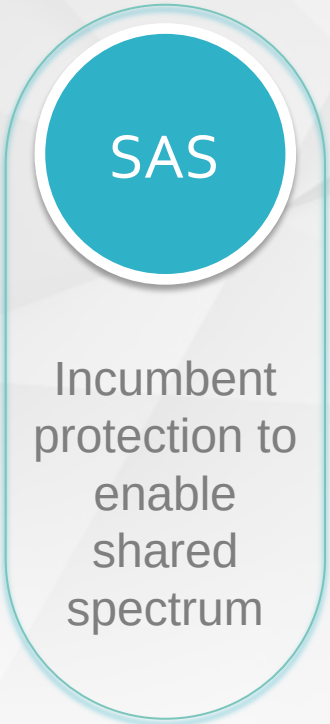
BWA

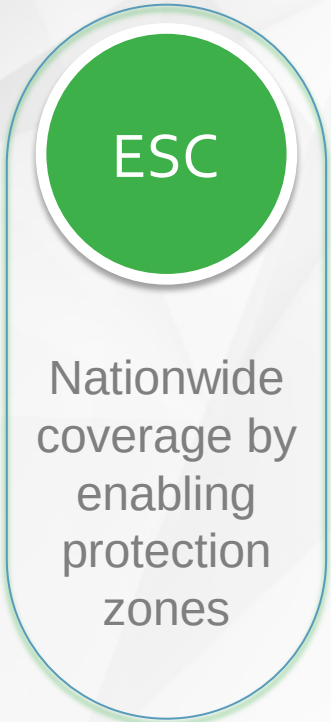
- Incumbent band users
- Rural Broadband

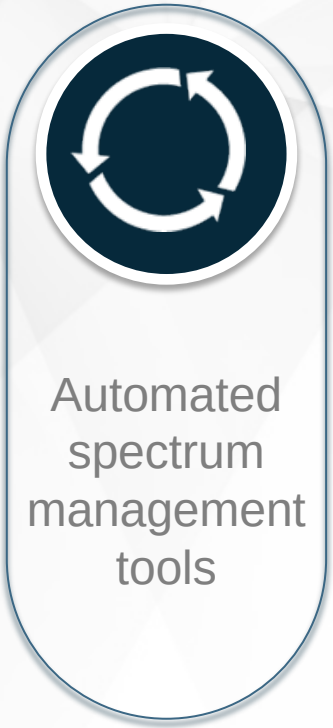
*Broadband Wireless Access Provider (includes WISPs)

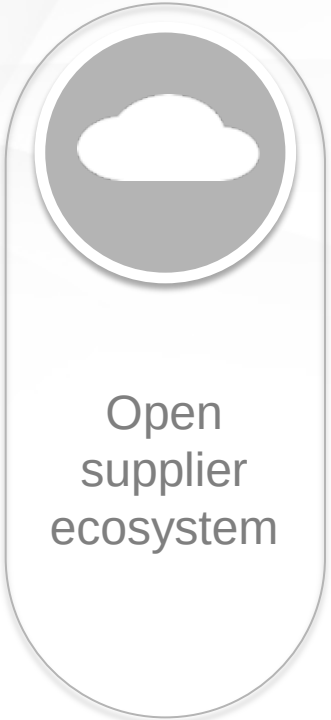
The Spectrum Controller

Industry's first controller for shared spectrum management









Federated Wireless Progress

Accomplishments

- 20+ OEM partner integrations to SAS
- 30+ SAS demonstrations and technical trials
- Launch of Spectrum Controller for field trials
- Field verification of commercial ESC sensor platform

Upcoming Milestones

- SAS & ESC certification
- Major field trials started in Q4 and going into 2018
- Roll out of ESC infrastructure
- Customer commercial launches (3 – 5 in 2018)
- First commercial revenue

Field trials

Announced and underway in Q4 2017

Charter

- Validate LTE and Spectrum Controller technology
- New wireless strategy
- First ESC deployments
- Large-scale access deployment
- Indoor and outdoor

ARRIS / Ruckus Wireless

- Enterprise and Residential Wi-Fi System Solutions
- Wireless and wired backhaul
- Smart City Wireless Infrastructure
- 17 active or completed CBRS trials

American Tower

- Wireless infrastructure solutions for enterprises and venues
- Flexible and unified end-to-end ecosystem
- New in-building solutions: CBRS, neutral host, private LTE

verizon

- First end-end carrier grade CBRS trial
- Network densification: advanced LTE
- Adds CBRS to unlicensed LTE portfolio and small cells
- Field trials to begin in the fall
- Key to ecosystem roll-out: devices; chipsets

Spectrum Controller: Trial Statistics

125+ CBSDs On-Air

18K+ Grants per week

254K Heartbeats per week

8 Different OEM Vendors

federated wireless™

Thank You